Report:

**Algorithm for code :**

1. Set maximum simulation Time(Tmax)=360 & delta time (DeltaT).=6 minutes
2. Calculated the probability of a plane's arrival (pa) based on DeltaT
3. Create variables to keep track of time (t), runway timer (Tr), total wait time (TotalwaitTime), and the number of planes landed (num\_planes\_landed).
4. Used the deque template class to store< airplanes> waiting to land (LandingQueue) & we created an instance of airport Runway (Runway)
5. Set the landing time(Tlanding) for the runway object (Runway).
6. Initialized a counter for the number of arrivals (n).
7. Started a while loop that runs as long as t < Tmax. Within the loop:

a. Generate a random R to check if a plane arrives (R<pa).

b. If an airplane arrives, check if the landing queue isFull() ; Else create a new (airplane) object and set its arrival Time ( t), wait time ( 0), and add it to the landing queue.

c. If (! landing queue.isempty()) && the runway timer (Tr) ==0,

retrieve the first airplane in the queue,

plane.setTwait(t - plane.getTarrival());,

pop it from the landing queue.

d. Set the runway to occupied, set the airplane object to the runway, and set Tr to the runway landing time. Increment the number of planes landed and output the arrival time, landing time, and wait time for the airplane.

f. because the runway is occupied, decrement the runway timer.

e. Increment the time counter (t) and arrival counter (n).

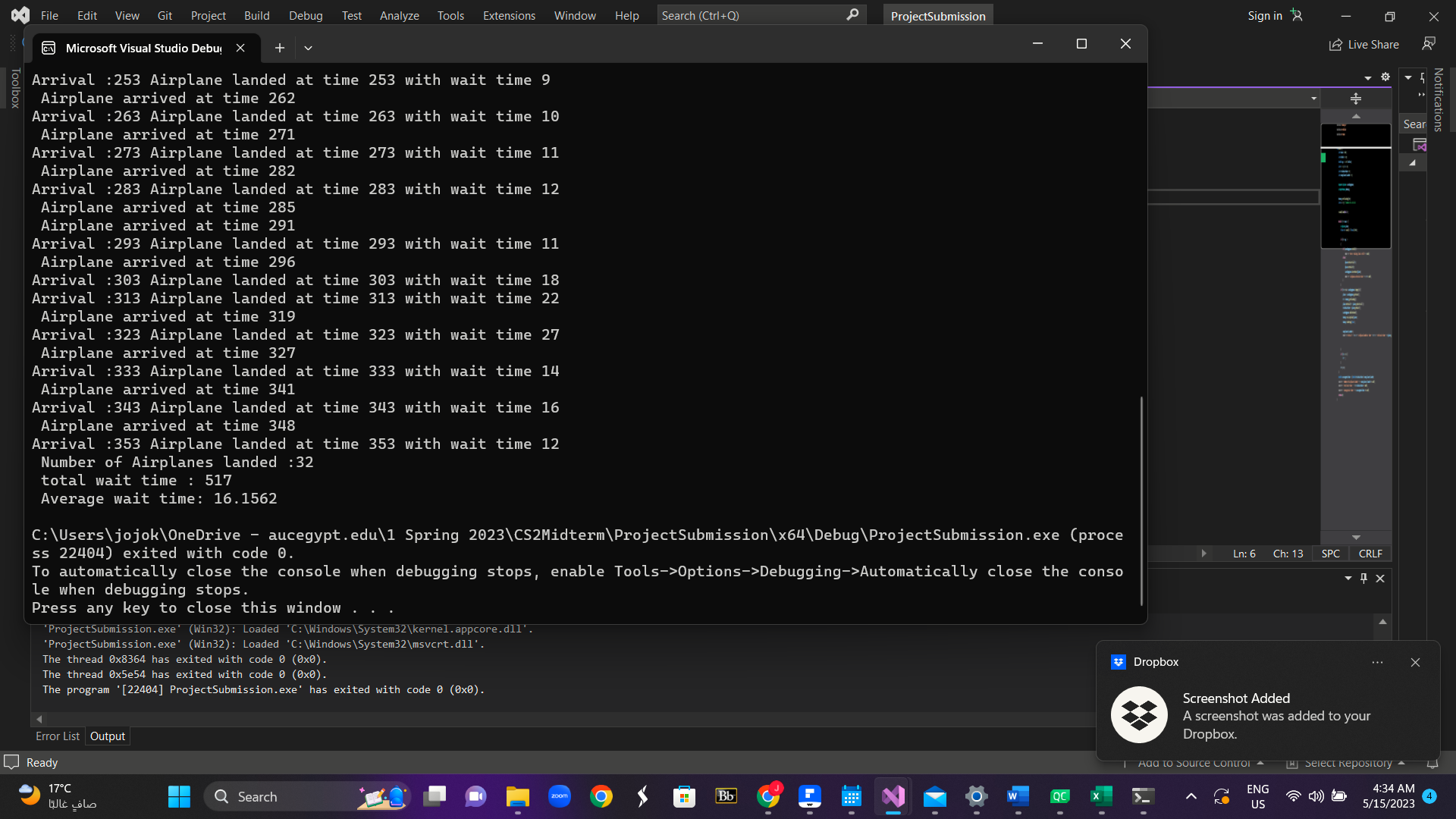
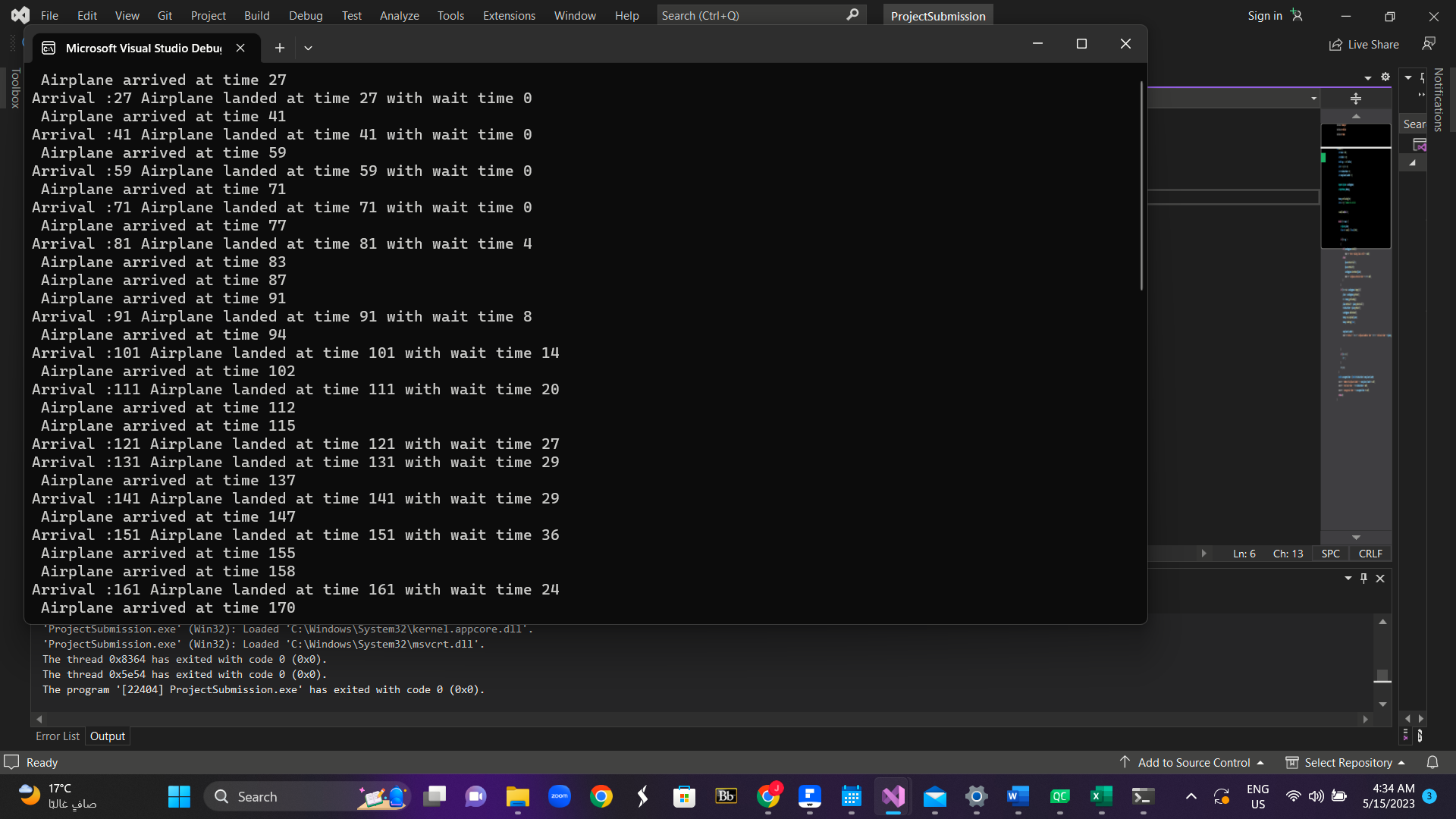
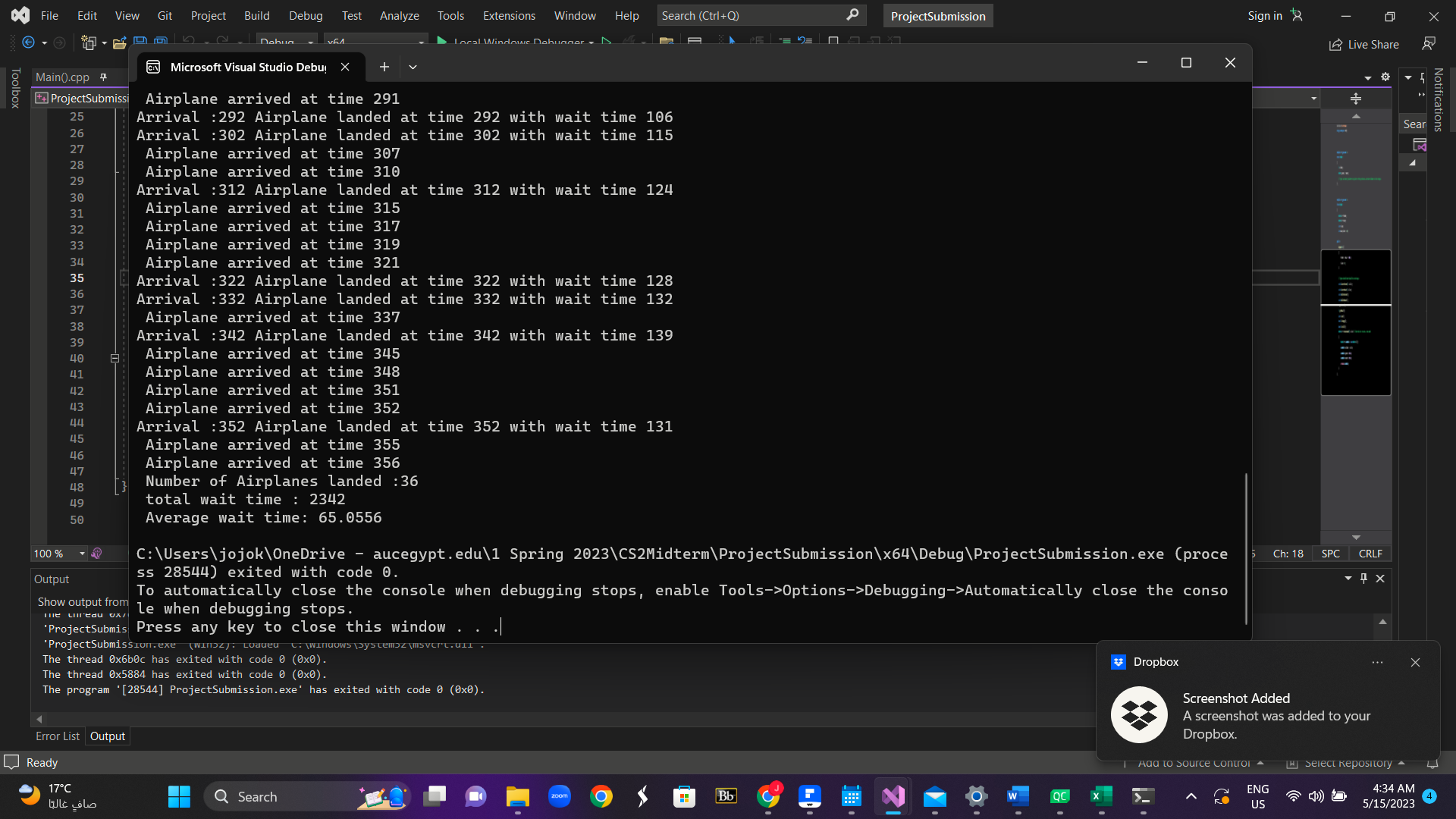
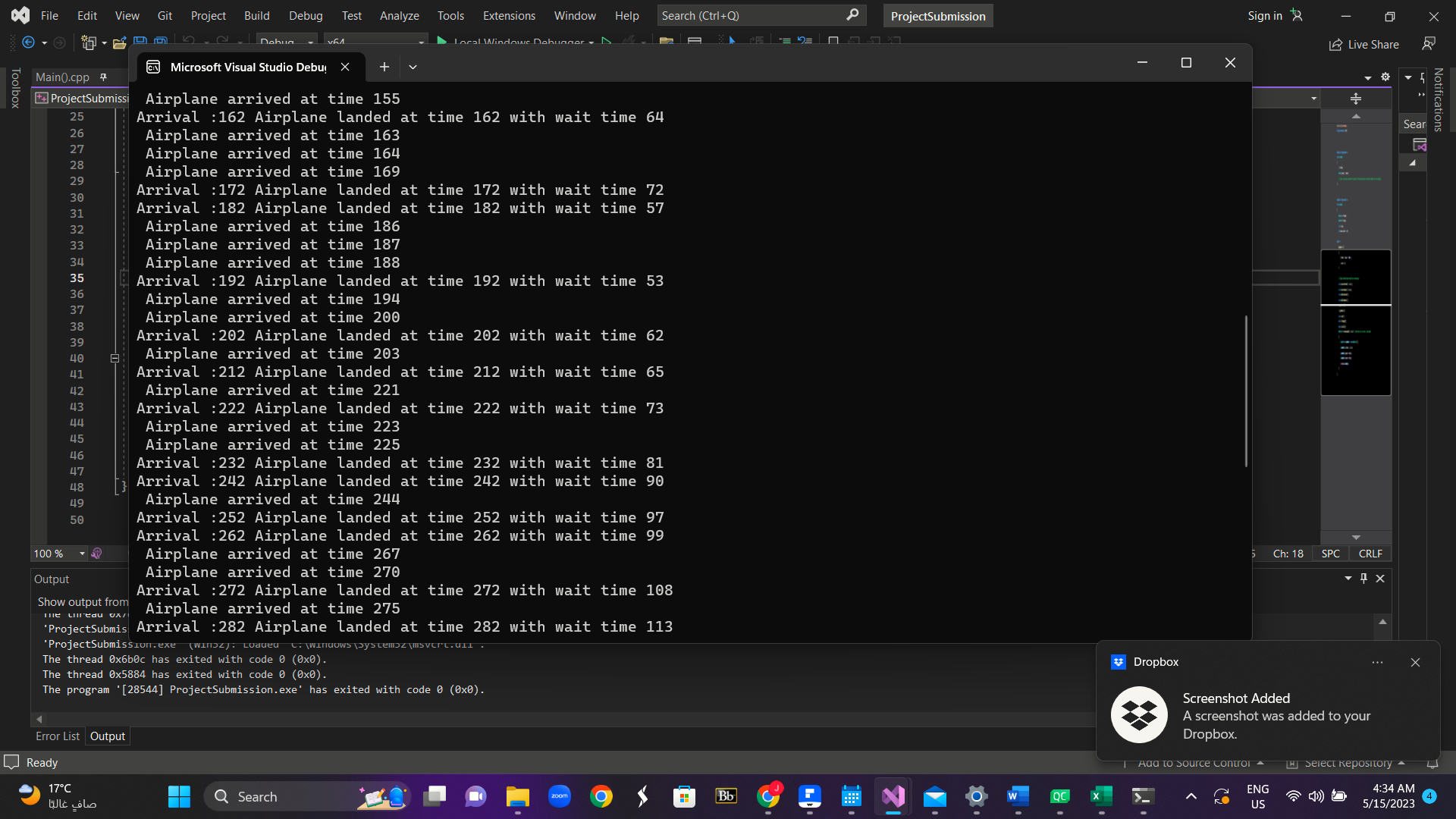
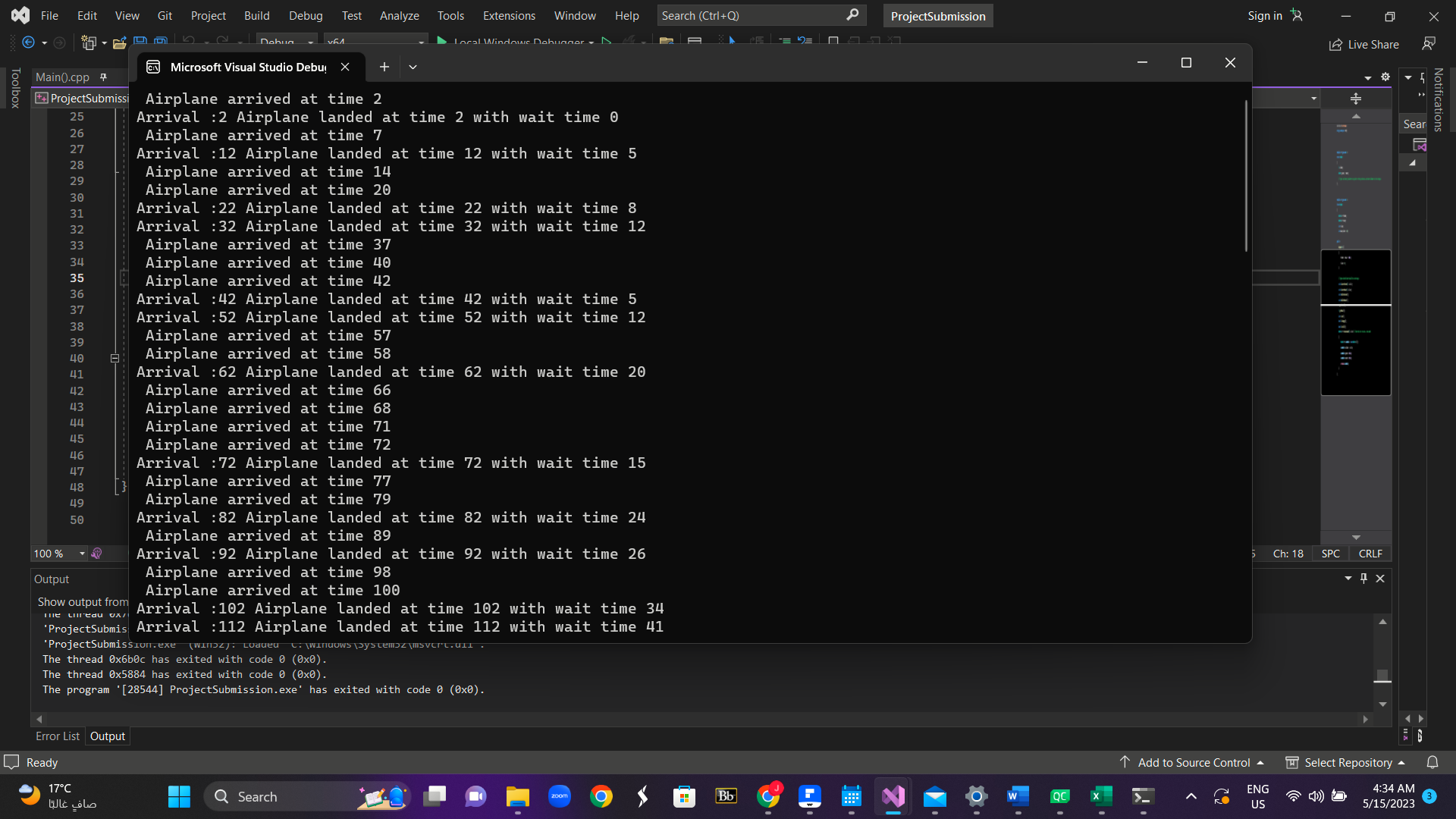
8. Calculate the average wait time by dividing the total wait time by the number of planes landed.

9. Output the number of planes landed, total wait time, and average wait time.

**Screenshots & comments :**

In the screenshots below, we were able to output a log of arrivals with their wait times for each airplane Then, we calculated the average wait time.

Conclusion: The average wait time changes with every run as the numbers change however, we noticed that as we increased Delta T (Average time between two arrivals), the average wait time decreased, which shows that it is important for airports to have a convenient and fixed time between two arrivals.

****